

**I. List: 205.601 Synthetic substances allowed for use in organic crop production**

**II. Category Use**

(j): As plant or soil amendments.

**III. Committee Summary:** In the decision making process on whether to continue the inclusion of aquatic plant extracts (alkali extraction) on the List, several questions have been raised that require a response. These include: What are the manufacturing processes? What do the extractants and stabilizers do to the product? Are there non-synthetic aquatic plant products available?

Seaweed (kelp) extracts can be produced from live, fresh plants using potassium hydroxide or sodium hydroxide (alkali's). Potassium hydroxide is the more preferred material due to concerns about the possible negative effects of sodium on the intended crops. The raw plant parts are 'digested' in the presence of the alkali to break open the cell walls of the plants. Some manufacturers use pressure in this part of the process, some do not. It is claimed that the high pressure environment allows the extraction of the cell contents of the kelp with less alkali, without the reduced yield of vital plant compounds that occurs by raising the temperature of the process. After extraction, the insoluble fraction of the mixture is filtered out and the liquid is either stabilized with an acid (such as phosphoric) or is dried to form a soluble powder (without acid stabilization). Liquid formulations would be overtaken with bacterial growth if the pH were not lowered to around 3.5. Natural acids such as citric are not able to accomplish this in the high pH (10) alkali type extracts.

The alkali extraction process does produce some chemical reactions in the raw material, although the complexity of the chemical mixtures found naturally in the plant material would make it almost impossible to quantify all the chemical changes. Clearly, the extraction and stabilization of liquid kelp extracts (alkali process) does change the amount of potassium and phosphorus in the finished product vs. the raw plant. One manufacturer (Acadian) commented that their process does not use any more of the alkali than necessary to produce the proper consistency of extract and no more phosphoric acid than necessary to lower the pH of the extract to an exact point. They contend that, at the recommended use rates for their material, considerably less than 1% of a typical crop's nutritional needs would be supplied. To go much beyond their use rates in order to obtain a fertilizer benefit from the material would be cost prohibitive to the grower and possibly detrimental to the crop due to the natural amount of sodium found in kelp/seaweed. Their comments are in response to concerns that fortification with synthetic nutrients might be occurring rather than simply extraction and stabilization of the product.

Some non-alkali extracted aquatic plant products have become available in recent years. These usually involve mechanical/physical disruption or pulverization of the seaweed. The liquid extracts are separated from the solids and stabilized with natural acids (citric, acetic). As described by the manufacturers, these materials would be considered non-synthetic. The component of plant growth substances in these products is said to be somewhat different than

the alkali extracted products. Some might be less available for beneficial activity to crop foliage due to less than complete extraction as compared to the alkali extracts. Some may be more available for beneficial crop activity due to the lack of chemical change in some of the less (alkali) stable plant compounds inherent to the seaweed. One apparent difference in the activity between the alkali and natural extracts can be learned from reading the application instructions of each type. The natural extracts discourage applications at or after bloom on many crops due to the tendency of these products to promote more vegetative growth at the expense of bloom. The alkali extracts, on the other hand, are well known for their beneficial effects on bloom.

The aquatic plant extracts used in organic crop production are completely unique in some of their beneficial attributes for crops. There are no substitute products that provide the same benefits to growers. They are somewhat unique even when comparing the benefits of alkali extracts and the non-alkali extracts.

#### **IV. Committee Recommendation:**

##### **Recommendations based upon comments received- 205.601(j)**

The Crops Committee recommends the renewal of the following:

**(1) Aquatic plant extracts (other than hydrolyzed) – Extraction process is limited to the use of potassium hydroxide or sodium hydroxide; solvent used is limited to that amount necessary for extraction.**

*Moved: Jeff Moyer      Second: Kevin Engelbert*  
*Committee vote: 3-0   2 absent (Delgado, Ostiguy)*

***Board vote:***